

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

- 1                   1.       (original) A method for mapping a user function for a programmable  
2 integrated circuit to a plurality of lookup tables, the method comprising:  
3                   decomposing the user function into a first set of decomposed functions, the user  
4 function receiving input variables;  
5                   determining whether the first set of decomposed functions can be implemented by  
6 one of a set of lookup table configurations for the programmable integrated circuit; and  
7                   if none of the set of lookup table configurations can implement the first set of  
8 decomposed functions, rotating at least two of the input variables of the user function.
- 1                   2.       (original) The method according to claim 1 further comprising:  
2                   decomposing the user function into a second set of decomposed functions; and  
3                   determining whether the second set of decomposed functions can be implemented  
4 by one of the set of lookup table configurations for the programmable integrated circuit.
- 1                   3.       (original) The method according to claim 1 further comprising:  
2                   if the user function is not successfully decomposed into a set of decomposed  
3 functions, rotating at least two of the input variables of the user function; and  
4                   attempting to decompose the user function into a second set of decomposed  
5 functions.
- 1                   4.       (original) The method according to claim 1 further comprising:  
2                   if one of the lookup table configurations can implement the first set of  
3 decomposed functions, placing lookup tables in the lookup table configuration into logic blocks  
4 on the programmable integrated circuit; and  
5                   configuring programmable routing resources to connect the logic blocks on the  
6 programmable integrated circuit.

1                   5.       (original) The method according to claim 4 wherein one of the lookup  
2 table configurations includes two 5-input lookup tables and one 6-input lookup table.

1                   6.       (original) The method according to claim 4 wherein at least two of the  
2 input variables are shared between two of the lookup tables.

1                   7.       (original) The method according to claim 4 wherein one of the lookup  
2 table configurations includes two 4-input lookup tables and one 6-input lookup table.

1                   8.       (original) The method according to claim 1 wherein decomposing the user  
2 function into the first set of decomposed functions further comprises decomposing the user  
3 function into first stage functions and a second stage function,  
4                   outputs of the first stage functions being inputs into the second stage function.

1                   9.       (original) The method according to claim 8 wherein rotating at least two of  
2 the input variables of the user function further comprises swapping at least one of the input  
3 variables of the first stage functions with at least one of the input variables of the second stage  
4 function.

1                   10.      (original) The method according to claim 9 further comprising:  
2                   attempting to decompose the user function into a second set of decomposed  
3 functions based on the rotated input variables.

1                   11.      (original) A computer program product stored on a computer readable  
2 medium for mapping a user function for a programmable integrated circuit to lookup tables, the  
3 computer program product comprising:  
4                   code for decomposing the user function into a first set of decomposed functions,  
5 wherein the user function receives input variables;  
6                   code for determining whether the first set of decomposed functions can be  
7 performed by a configuration of lookup tables on the programmable integrated circuit; and  
8                   code for rotating at least two of the input variables of the user function if none of  
9 the configurations of lookup tables can implement the first set of decomposed functions.

1                   12.   (original) The computer program product according to claim 11 further  
2 comprising:  
3                   code for rotating at least two of the input variables of the user function if the user  
4 function is not successfully decomposed into a set of decomposed functions; and  
5                   code for attempting to decompose the user function into a second set of  
6 decomposed functions.

1                   13.   (original) The computer program product according to claim 11 wherein  
2 the code for decomposing the user function into the first set of decomposed functions further  
3 comprises code for decomposing the user function into first stage functions and a second stage  
4 function, outputs of the first stage functions being inputs into the second stage function.

1                   14.   (original) The computer program product according to claim 13 wherein  
2 the code for decomposing further comprises:  
3                   code for decomposing the user function into a second set of decomposed  
4 functions based on the rotated input variables, the second set of decomposed functions including  
5 first stage functions and a second stage function,  
6                   wherein at least two input variables of the first and the second stages of the  
7 second set of decomposed functions have been rotated with respect to input variables of the first  
8 and the second stages of the first set of decomposed functions.

1                   15.   (original) The computer program product according to claim 11 wherein  
2 the code for decomposing the first function into the second functions further comprises code for  
3 decomposing the first function into the second functions using a non-disjoint decomposition  
4 technique.

1                   16.   (original) The computer program product according to claim 11 wherein  
2 the code for decomposing the first function into the second functions further comprises code for  
3 decomposing the first function into the second functions using a disjoint decomposition  
4 technique.

1                   17.     (original) The computer program product according to claim 11 further  
2 comprising:  
3                   code for placing lookup tables in one of the lookup table configurations into logic  
4 blocks on the programmable integrated circuit, if that lookup table configurations can implement  
5 the decomposed functions; and  
6                   code for configuring programmable routing resources to connect the logic blocks  
7 on the programmable integrated circuit.

1                   18.     (original) The computer program product according to claim 11 wherein  
2 one of the lookup table configurations includes two 5-input lookup tables and one 6-input lookup  
3 table.

1                   19.     (original) The computer program product according to claim 11 wherein  
2 one of the lookup table configurations includes two 4-input lookup tables and one 6-input lookup  
3 table.

1                   20.     (original) The computer program product according to claim 11 further  
2 comprising:  
3                   code for decomposing the user function into a second set of decomposed  
4 functions based on the rotated input variables, if none of the configurations of lookup tables can  
5 implement the first set of decomposed functions; and  
6                   code for determining whether the second set of decomposed functions can be  
7 implemented by one of the configurations of lookup tables for the programmable integrated  
8 circuit.